

New and little known species of African *Laccophilus*
(Coleoptera: Dytiscidae)

by

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The following two new species were included in the collection of Dytiscidae obtained by the Ross expedition to Africa 1957–58 and sent to me for study and identification by the Californian Academy of Sciences, U.S.A. The third has been in my collection undescribed since 1948.

Laccophilus mateui spec. nov.

L. 5·0 mm. Convex, widely oval, little narrowed behind; submat; testaceus with vague darker and lighter markings on the elytra, the latter forming an oblique band of lineoles in the posterior third. Metacoxae without a stridulatory file.

Head. Testaceus, brownish behind; reticulation double, the larger irregularly polygonal. The antennae of the unique type are broken but the basal joints are testaceus.

Notum. Testaceus with the hind border narrowly rufotestaceus. Base prolonged backwards in the middle forming a wide angle; sides rounded. Reticulation single and irregularly polygonal with irregularly scattered micropunctures on the meshwork.

Elytra. Testaceus with the base, side margins, apex, traces of anterior and median oblique bands of lineoles and a clear posterior band lighter. The oblique lighter bands are accompanied by ill-defined darker markings. Discal serial row of punctures fine and difficult to see, in places double. In the posterior third a medium-sized confused punctuation is present. The reticulation is well impressed and double, the larger very irregularly polygonal and accompanied by a micropunctuation, the smaller clearly visible behind but less so in front.

Underside. Brownish testaceus with prosternum, mesosternum, hind abdominal segments and epipleura lighter. Prosternal process rather short, hind border of the metacoxal processes clearly notched in the middle; no metacoxal file.

MALE. Anterior and mesotarsi not much widened; aedeagus as in fig. 1. (In this and all other figs. of the aedeagi the median lobes are mounted for purposes of comparison so that the expanded apical portion is as horizontal as possible and the view is of the dorsal, i.e. convex, side.) The apical cilia of the parameres are very fine and almost invisible.

LOCALITY. Aguelm, Ymeleullaven, Hoggar, Sahara. J. Mateu coll., 18.v.1951. Unique ♂ holotype.

This species from the isolated central region of the Sahara is on first sight very like *L. hyalinus* De Geer., which ranges from Europe and the Mediterranean coast of Africa through Persia, Turkestan and Asia. It is, however, without a metacoxal file, which *hyalinus* possesses, and the median lobe of the aedeagus is clearly different, being much wider in the expanded portion and therefore more leaflike.

The type, at present in my collection, will be returned to the Californian Academy of Sciences, San Francisco, U.S.A.

***Laccophilus mutatus* spec. nov.**

Laccophilus grammicus Guignot nec Sharp. Guignot, 1945:365; 1959:548, 550 (fig. 485).

L. 4·2–4·5 mm. Convex, oval, but narrowed and flattened behind. Testaceus with slightly flexuous and often broken black lines on the elytra. Metacoxae without a stridulatory file.

Head. Testaceus, vaguely brownish behind; reticulation double with micropunctures at the points of intersection of the larger meshes. Antennae testaceus.

Pronotum. Testaceus with hind margin narrowly brown and with lighter brown marks, sometimes taking the form of two spots, in the middle of the anterior margin. The disc is also sometimes clouded with brown. Reticulation rather indistinctly and irregularly double, the larger mesh very irregular and almost without micropunctures on the meshwork. Base not much produced backwards in the middle, sinuate at the sides.

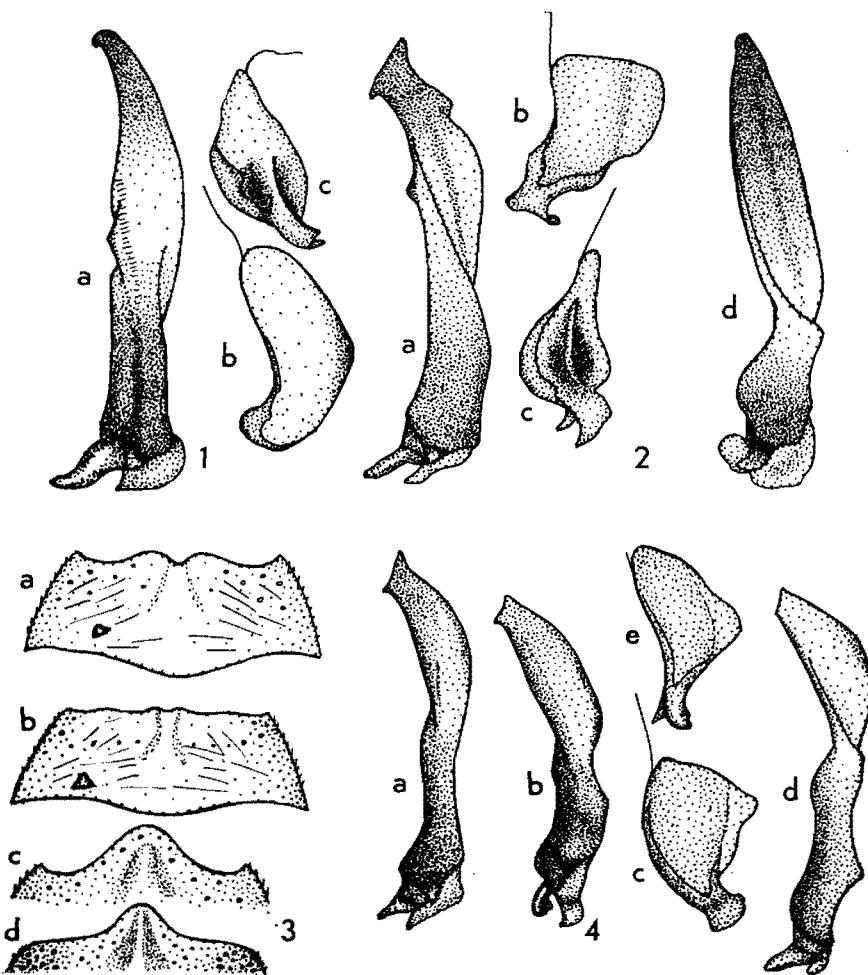
Elytra. Narrowed behind, sides rounded. Testaceus with the suture and seven slightly flexuous longitudinal lines, of which the inner is broad and the outer represented by only a few discrete lengths, black. Only some of the lines reach the base, thus leaving an interrupted basal testaceus band, and in most individuals there is an interruption of the black lines in the posterior third resulting in a rather vague ante-apical testaceus area. In some individuals, owing to the reduction in width of the black lines, there is also an anterior lighter area, and in all the apex is testaceus. The reticulation is double, the smaller well impressed and the larger very irregular, with only a few micropunctures here and there on the network.

Underside. Brownish testaceus with the prosternum, abdominal segments, epipleura and legs, except the metatarsi, lighter. Prosternal process long, hind border of the metacoxal processes very slightly notched and very slightly sinuate. Metacoxae without a stridulatory file.

MALE. Anterior and mesotarsi with well-developed small suckers. Posterior border of the last visible abdominal sternite rather deeply notched in the middle, sinuate, and emarginate at the sides (fig. 3a). Aedeagus as in fig. 2.

LOCALITIES. KENYA: Athi River, ♂ holotype, ♀ allotype and 6 paratypes, 19.x.1954; 17 miles S.W. of Nairobi, 24.xi.1957, 12 paratypes. TANZANIA: 58 miles west of Arusha, 1 paratype. All collected by E. S. Ross and R. E. Leach. The holotype, allotype and some paratypes will be returned to the Californian Academy of Sciences, San Francisco, U.S.A.

This species was described and its aedeagus figured by Guignot (1945, 1959) as *grammicus* Shp. That species, however, differs in being slightly smaller and more narrowed behind; in the bolder pattern of the elytra, the black lines being wider; in the only slightly notched posterior border of the last visible sternite of the male (fig. 3b), and the corresponding sternite of the female not emarginate at the sides (fig. 3d).



Figs. 1-4. *Laccophilus* spp. 1. *L. mateui* spec. nov.; (a) median lobe, (b) right paramere, (c) left paramere of aedeagus. 2a-c. *L. mutatus* spec. nov.; (a) median lobe, (b) right paramere, (c) left paramere of aedeagus; (d) *L. grammicus* Shp., median lobe of aedeagus. 3. Last visible abdominal sternite of (a) *L. mutatus* ♂, (b) *L. grammicus* ♂; posterior border of last visible abdominal sternite of (c) *L. mutatus* ♀, (d) *L. grammicus* ♀. 4. Median lobe of aedeagus of (a) *L. continentalis* Gschw., (b) *L. perplexus* spec. nov., (d) *L. taeniolatus* Rég.; right paramere of (c) *L. perplexus*, (e) *L. taeniolatus*.

The median lobe of the aedeagus has quite a different design and is much more strongly curved downwards (fig. 2d). The median lobe of *mutatus* spec. nov. resembles that of *L. quindecimvittatus* Rég., but differs from it in having the apical third more downwardly curved and a ventrally directed extension from about the middle of the right side, appearing in dorsal view as a blunt tooth.

***Laccophilus perplexus* spec. nov.**

L. 3·8 mm. Oval, rather wide and convex at the shoulders, narrowed behind. Testaceus with longitudinal flexuous black lines on the elytra some of which show an indication of twinning, i.e. they have discontinuous narrow testaceus colouring in the centre. Underside brownish testaceus.

Head. Testaceus, brownish behind; finely and very irregularly doubly reticulate, the double reticulation more evident behind.

Pronotum. Testaceus with hind margin narrowly black and anterior margin rather widely brown in the middle with a backward prolongation on to the disc. Base rather shallowly and widely angled in the middle. The reticulation is very irregular, sometimes longitudinal, sometimes horizontal, sometimes polygonal and only clearly double at the sides.

Elytra. Widest and most convex in front of the middle, considerably narrowed behind. Suture narrowly black with a narrow yellow line external to it, clear at the base but fainter and interrupted for the rest of its length, bounded externally by another slightly flexuous black line branched in front and for the rest of its length sending out lateral connections to the next flexuous line which is almost twinned. This latter line is abbreviated in front, leaving at the base of the elytron a longitudinal testaceus space uncrossed by black lines. The second, third and fourth flexuous lines are almost twinned, the remainder simple and broken, especially behind where the apex and a preapical region are almost free from black marks. The reticulation is predominantly single, small and well impressed but there is also an intermittent and incomplete larger reticulation more evident in the posterior third. In the posterior half, along each black line, irregular flexuous scratch-like marks can be seen, presumably derived from the meshes of the larger reticulation. There are a few scattered shallow, fine punctures and the serial rows are irregular and not very evident.

Underside. Brownish testaceus with the prosternal process and abdominal sternites darker and the legs and epipleura lighter. Metacoxal processes not notched, their posterior borders very slightly oblique. Metacoxae without a stridulatory file.

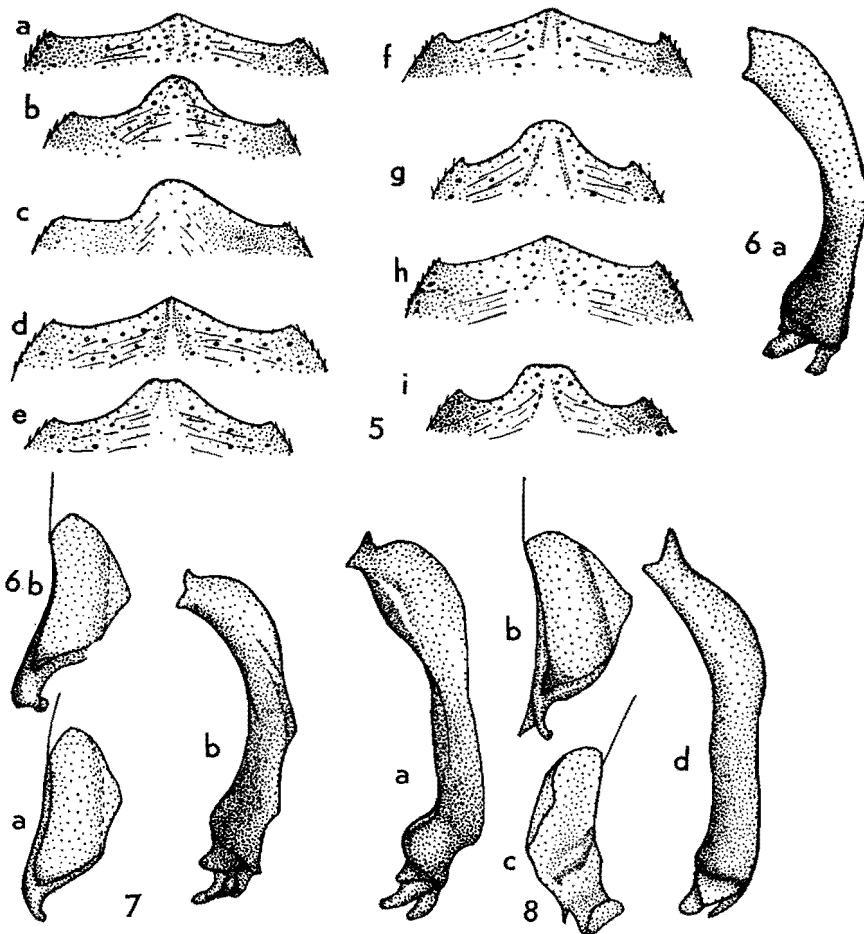
MALE. Aedeagus as in fig. 4b and c. The last visible abdominal sternite is deformed in the unique type but the posterior border has a rounded median salient resembling that found in the females of the group, and the external angles are very slightly emarginate (fig. 5c).

LOCALITY. Umobeluzi River near Goba, Mozambique. ♂ holotype. 4.xii.1948.

The species appears to be intermediate between *L. continentalis* Gschw. and *taeniolatus* Rég., as congener O-C is between *taeniolatus* Rég. and *propinquus* O-C (median lobes of the aedeagi figs. 4, 6, 7 and 8). The type, at present in my collection, will be deposited in the British Museum (Natural History), London.

***Laccophilus perplexus* spec. nov. and the *L. posticus* Aubé complex**

This new species from Mozambique evidently belongs to the complex of species, subspecies or hybrids that are closely related one to the other and to *L. posticus* from Madagascar. They all have on the elytra longitudinal, flexuous, sometimes anastomosing black lines and the reticulation varies from small single with only slight indications of a larger meshwork to almost completely double, although the larger meshwork is never entirely complete. The median lobes of the aedeagi, although clearly different



Figs. 5-8. *Laccophilus* spp. 5. Posterior border of last visible abdominal sternites of (a) *L. continentalis* Gschw. ♂, (b) *idem* ♀, (c) *L. perplexus* spec. nov. ♂, (d) *L. taeniolatus* Rég. ♂, (e) *idem* ♀, (f) *L. congener* O-C. ♂, (g) *idem* ♀, (h) *L. propinquus* O-C. ♂, (i) *idem* ♀. 6. *L. propinquus*; (a) median lobe, (b) right paramere of aedeagus. 7. *L. congener*: (a) right paramere, (b) median lobe of aedeagus. 8. (a) median lobe, (b) right paramere of *L. simplicistriatus* Gschw.; (c) right paramere, (d) median lobe of *L. posticus* Aubé.

from each other, could well be modifications of a central archetype close to that of *posticus* Aubé (fig. 8d).

The species included in this complex are *L. cervicalis* Rég., *L. posticus* Aubé, *L. complicatus* Shp. (all from Madagascar), *L. simplicistriatus* Gschw., *L. congener* O-C., *L. propinquus* O-C., *L. perplexus* O-C., *L. taeniolatus* Rég. and *L. continentalis* Gschw.

The distribution of the African species is interesting. *L. congener* ranges throughout, refuting my suggestion, based on the variability in the numbers of twinned lines

on the elytra in different individuals, that it might be a hybrid. *L. taeniolatus* occupies the tropics and subtropics mainly north of the equator, *L. continentalis* the tropics and subtropics south of the equator, including Zanzibar, and *L. simplicistriatus* occurs from as far north-east as the southern Sudan and Abyssinia to the Transvaal and South West Africa in southern Africa. (The records of this species, Legros (1954: 269) and Guignot (1943: 99, 1952: 522), from West Africa probably refer to *congener* O-C., since Guignot's interpretation of *simplicistriatus* Gschw. was, until 1959, mistaken.) *L. propinquus* has been recorded from Rhodesia, Malawi and Zanzibar, and *L. perplexus* is only known by the unique type from Mozambique.

The following key enumerates the characters, apart from aedeagi, which may be used to separate the species.

Key to the species of the *L. posticus* complex

- 1 Longitudinal flexuous black lines on the elytra predominantly twinned.
- 2 Pronotum with an anterior and posterior narrow black band, the anterior sometimes broadened in the middle but not triangularly. Elytral reticulation almost completely double. 3·7-4·1 mm *taeniolatus* Rég.
- 2' Pronotum with an anterior and posterior black band the anterior subtending a triangular brownish or rufotestaceus mark on to the disc. Elytral reticulation single with only traces of an incomplete larger meshwork. 3·6-4·2 mm *continentalis* Gschw.
- 1' Longitudinal flexuous black lines on the elytra predominantly single but sometimes with a varying proportion of twinned lines.
- 3 Some of the flexuous black lines twinned.
- 4 Suture of the elytra, except the apex, rather broadly and continuously black. Sides not very rounded. Reticulation of the pronotum indistinctly double, the smaller indistinct and intermittent the larger small meshed and very irregular. 3·8-4·1 mm *congener* O-C.
- 4' Suture of the elytra not broadly black. Sides very rounded. Reticulation of the pronotum double, the small very evident the larger irregular. 3·6-4·1 mm *posticus* Aubé.
- 3' None of the flexuous black lines twinned.
- 5 Suture of the elytra broadly black except at the apex. Disc of the pronotum darkened. 3·9-4·1 mm *propinquus* O-C.
- 5' Suture not broadly black for the whole of its length except the apex.
- 6 Suture rather broadly black for a part of its length, usually a short length in the posterior third and often another anteriorly. Flexuous black lines not broad and often confused. 3·6-4·0 mm *simplicistriatus* Gschw.
- 6' Suture not broadly black for any part of its length.
- 7 Flexuous black lines on the elytra broad.
- 8 Flexuous black lines with no indication of twinning. Disc of pronotum not darkened. Size smaller, form narrower. Posterior border of the last visible sternite of the male widely angled in the middle. 3·3-3·5 mm *cervicalis* Rég.
- 8' Flexuous black lines of the elytra with an indication of twinning Disc of pronotum marked by a rufotestaceus triangular backward extension of the anterior border. Size larger, form wider. Last visible abdominal sternite of the male with the salient median portion rounded at the sides and widely truncate. 3·80 mm *perplexua* spec. nov.
- 7' Flexuous black lines on the elytra rather narrow, form wide. Posterior border of the last visible sternite of the male widely angled in the middle. 4·3-4·7 mm *complicatus* Shp.

Laccophilus adspersus Boh., *L. livens* Rég. and *L. vitshumbii* Guign.

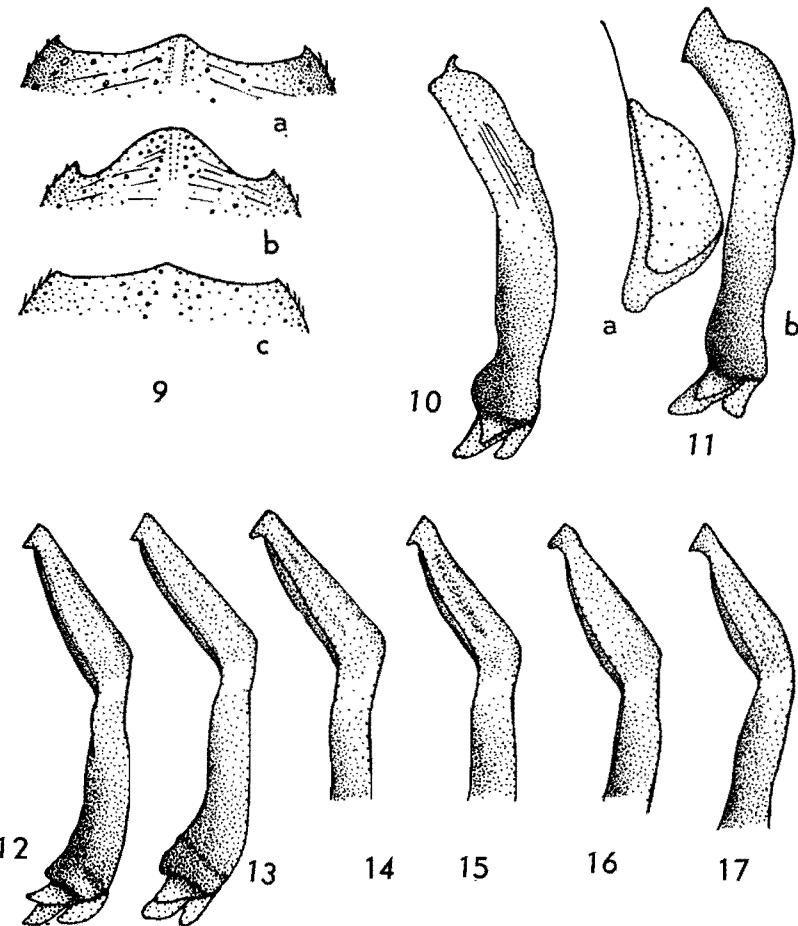
All three of these forms falling within the *L. adspersus* complex have been mistaken by authors one for another. They differ from the members of the *L. posticus* complex in that the dark markings on the elytra, except at the base, take the form of confused vermiculations rather than flexuous lines and the elytral reticulation is clearly double except usually in the scutellary region where the small mesh is often absent.

Having seen the type of *L. livens* Rég. I agree with Balfour-Browne that it falls into synonymy with *L. adspersus* Boh.

Laccophilus adspersus Boheman, 1848: 246.

Laccophilus livens Régimbart, 1895:135. **syn. nov.**

Laccophilus adspersus Boh. was described from specimens collected in 'Cafraria interiore', roughly the northern areas of South Africa, and *L. livens* Rég. from specimens from the Congo. Régimbart differentiates *livens* from *adspersus* by the more elongate reticulation at the base of the elytra. Individuals of *adspersus* however, from South



Figs. 9-17. *Laccophilus* spp. 9. Posterior border of last visible abdominal sternite of (a) *L. simplicistriatus* Gschw. ♂, (b) *idem* ♀, (c) *L. cervicalis* Rég. ♂. 10. *L. complicatus* Shp., median lobe of aedeagus. 11. *L. cervicalis* Rég.; (a) right paramere, (b) median lobe of aedeagus. 12-17. Median lobe of aedeagus of (13) *L. livens* Rég. (type), *L. adspersus* Boh. from (12) eastern Cape Province, South Africa, (14) Uganda, (15) Malawi, (16) Kenya, (17) *L. adspersus nigeriensis* subsp. nov. from the Jos plateau, Nigeria.

Africa show considerable differences in the width and elongation of this basal reticulation whilst Guignot says of *adspersus* 'Mailles de la grande réticulation fortement allongées dans la région juxtascutellaire'. The type of *livens* Rég. has a basal elongate reticulation but not more so than in some *adspersus* from South Africa. The *livens* type also has lighter preapical lunules on the elytra, but some of my South African *adspersus* show an indication of this and the condition is quite clear in specimens from Rhodesia and Malawi. The presence or absence of this lighter region in the posterior third of the elytron is not a specific character in this nor any of the other species in the group.

The median lobe of the aedeagus of the type of *livens* differs little from the median lobes of southern *adspersus* which themselves vary a little in the width of the apical expanded portion. It is a little stouter and the indentation before the apex is less well marked (figs. 12 and 13).* It is impossible to separate some of the South African *adspersus* from *livens* on aedeagal differences, and a specimen named *livens* Rég. by Guignot from the Ivory Coast has a quite typical *adspersus* aedeagus. It seems, therefore, that *livens* Rég. does not even merit subspecific status. Figs. 12-16 depict median lobes of the aedeagus of *L. adspersus* Boh. from South Africa, Congo (*livens* Rég.), Uganda, Malawi and Kenya. The Angola examples are so similar to the Malawi one that they have not been figured.

Laccophilus adspersus nigeriensis subsp. nov.

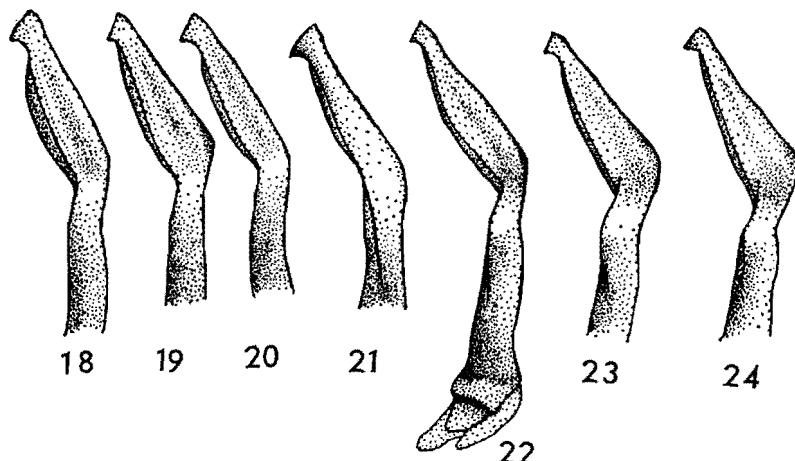
From Nigeria I have a series very similar to *L. adspersus* Boh., all of them with a preapical lighter lunule on the elytra, with a somewhat variable basal elytral reticulation which in the majority is smaller, narrower and more elongate than in *adspersus*, and with the fine punctuation on the mesh of the larger reticulation denser and more evident. The median lobe of the aedeagus is very similar to that of *adspersus* but in the majority the expanded apical region is narrower and the preapical indentation on the right side is longer (figs. 17 and 18). Three specimens, two from the River Kaduna in company with normal specimens and one from Bukuru, in other respects similar to the majority, have median lobes indistinguishable from those of *adspersus* (fig. 19). The similarities between this form and typical *adspersus* are too great to justify separation as a different species but a subspecific status does seem to be warranted by the minor differences.

LOCALITIES. NIGERIA: Reservoir, Jos, 10.iv.1963, ♂ holotype, ♀ allotype and 5 paratypes; stream near Zaria, 4.iv.1963, 6 paratypes; stream, Kaduna-Kontagora road, 3.iv.1963, 1 paratype; river, Jos-Bauchi road, 9.iv.1963, 4 paratypes; detritus pond, Jos-Bauchi road, 9.iv.1963, 18 paratypes; Kaduna river, 13.x.1963, 2 paratypes, 13.x.1963, 2♂♂; stream near Bukuru, 11.iv.1963, 1♂.

Laccophilus adspersus sudanensis subsp. nov.

From the Sudan I have, unfortunately, only one male belonging to the complex of varying *adspersus* populations. It has the lighter preapical area on the elytra, the smaller more evidently micropunctured meshwork of the basal reticulation and the more conspicuous indentation before the apex of the median lobe of the aedeagus exhibited by the Nigerian specimens. The expanded portion of the median lobe, how-

* My figures of the aedeagus of *adspersus* Boh. (Omer-Cooper, 1957:16, fig. 12; 1958:49, fig. 96) are in fact of *vitshumbii* Guign., a species then unrecognised by me.



Figs. 18–24. *Laccophilus* spp. Median lobe of aedeagus of (18) *L. adspersus nigeriensis* subsp. nov. from Bauchi, Nigeria, (19) *idem* from Kaduna river, Nigeria (cf. fig. 12), (20) *L. adspersus sudanensis* subsp. nov. from the Sudan, (21) *L. modestus* Rég., (22) *L. vitshumbii* Guign. (paratype) from the Congo, (23) *idem* from Abyssinia, (24) *idem* from Malawi.

ever, is even narrower and almost parallel-sided (fig. 20). This form also seems to merit subspecific status.

LOCALITY. SUDAN: rain ponds S. of Rumbek near Wulu, 19.vii.1954, holotype ♂. The types of this and the preceding subspecies will be placed in the British Museum (Natural History), London.

Distribution of *L. adspersus* Boh. and its subspecies as known to me

South Africa (type series), Angola, Swaziland, Rhodesia, Malawi, Congo (*livens* Rég.), Uganda, Kenya, Ivory Coast, Nigeria (subsp.), Sudan (subsp.). All three forms may easily be confused with *L. modestus* Rég. In that species, however, the vermiculations on the elytra are even denser and more confused than in *adspersus* and in most cases the bases of the flexuous lines, which posteriorly become converted into vermiculations and are usually clear in *adspersus*, are absent or only barely indicated. The median lobe of the aedeagus although somewhat similar is clearly different (fig. 21), more so than my earlier fig. (Omer-Cooper, 1958: 49) makes apparent.

Laccophilus vitshumbii Guignot, 1957: 161, 169 (fig. 13)

Some years ago Mr. J. Balfour-Browne drew my attention to the discrepancy between the aedeagi of specimens from Abyssinia which I had determined (Omer-Cooper, 1931: 756) as *L. adspersus* Boh. and specimens of the true *adspersus* Boh. from southern Africa. He considered the Abyssinian material to belong to a new species for which he proposed the name *cessatus*. Unfortunately the description of the new species was never published, although specimens were distributed to museums under that name. In 1957 Guignot described *L. vitshumbii* from the Congo; this species seems to be identical with Balfour-Browne's *cessatus* nomen nudum.

L. vitshumbii Guign. is very similar indeed to *adspersus* Boh. but the reticulation at the base of the elytra is usually narrower and more elongate than in that species. It is, as in *adspersus* Boh., somewhat variable and in some specimens the distinction is not so clear. A lighter preapical area on the elytron may or may not be present. The median lobe of the aedeagus is, however, recognisably different. As always there is a certain amount of variation but it is more twisted and the apex is narrower, so that in the view presented in the figs. 22, 23 and 24 the left margin of the expanded portion is slightly sinuate, and the basal region is more depressed.

To my knowledge the distribution of the two species overlaps in Kenya, Uganda, Malawi and Rhodesia, but I have seen no aedeagi of intermediate form. It seems therefore that *vitshumbii*, although closely related to *adspersus* Boh. and, apart from the aedeagus, indistinguishable with certainty from it, is a good species. Its distribution as known to me comprises Abyssinia, Uganda, Kenya, Malawi, Rhodesia, and Tanzania.

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